

What Is Claimed Is:

1 A. A method for communicating, comprising the steps of:

2 (1) selecting a radio frequency band from the electromagnetic (EM)

3 spectrum as a band of interest;

4 (2) selecting a channel within said band of interest as a channel/band

5 combination;

6 (3) causing an input filter device to filter the EM spectrum thereby

7 passing said channel/band combination;

8 (4) down-converting said channel/band combination to create a down-

9 converted signal; and

10 (5) causing an output filter to filter said down-converted signal to

11 create a filtered down-converted signal.

1 2. The method of claim 1, wherein step (4) comprises:

2 (a) receiving said channel/band combination;

3 (b) aliasing said channel/band combination according to an aliasing

4 signal, said aliasing signal having an aliasing frequency, said aliasing frequency

5 being a function of a clock signal; and

6 (c) outputting a down-converted signal.

1 3. The method of claim 2, wherein said down-converted signal is an

2 intermediate frequency signal.

1 4. The method of claim 2, wherein said down-converted signal is a baseband
2 signal.

1 5. The method of claim 2, wherein said clock signal has a clock frequency,
2 the method further comprising the step of:

6. The method of claim 1, further comprising the step of:

(6) decoding said filtered down-converted signal to create a decoded down-converted signal.

7. A system for communicating, comprising:

a controller that operates under the direction of a user, and that issues a first command signal and a second command signal;

a control signal generator to generate a control signal according to said first command signal; and

a unified down-converting and filtering (UDF) module to filter and down-convert one or more input signals based on said control signal and according to said second command signal, said UDF to thereby output a channel filtered and down-converted signal.

8. The system of claim 7, further comprising a decoder to generate a decoded output signal from said channel filtered and down-converted signal.

B10 cont. 9. The system of claim 7, wherein said control signal generator is a voltage controlled oscillator.

1 10. ~~The system of claim 7, wherein one of said one or more input signals is~~
2 selected as a selected input signal and said UDF module comprises:

6 (2) a filter, comprising:

(a) at least a portion of said frequency translator;

(b) at least one delay module to delay instances of an output signal; and

(c) an adder to generate an instance of said output signal from at least one of said delayed input samples.

11. The system of claim 10, wherein said frequency translator comprises a down-convert and delay module to under-sample said selected input signal according to said control signal, wherein a frequency of said control signal is equal to a frequency of said selected input signal plus or minus a frequency of said down-converted image, divided by n , where n represents a harmonic or sub-harmonic of said input signal.

12. The system of claim 8, wherein said controller issues a third command signal, and wherein said decoder operates according to said third command signal.

13. A method of communicating, comprising the steps of:

2 (1) specifying one or more radio frequency bands from the
3 electromagnetic spectrum as bands of interest;

4 (2) specifying one or more channels within each of said bands of
5 interest as channel/band combinations;

6 (3) selecting one of said channel/band combinations as a monitored
7 channel/band combination;

8 (4) causing an input filter to operate with said monitored channel/band
9 combination, and filtering an input signal using said input filter, to create a
10 filtered signal having a frequency within said monitored channel/band
11 combination;

12 (5) down-converting said filtered signal to create a down-converted
13 signal;

14 (6) causing an output filter to operate with said monitored
15 channel/band combination, and filtering said down-converted signal using said
16 output filter; and

17 (7) causing said output filter to generate a filtered down-converted
18 signal from said down-converted signal.

1 14. The method of claim 13, wherein step (5) comprises:

2 (a) receiving said filtered signal;

3 (b) aliasing said filtered signal according to an aliasing signal, said
4 aliasing signal having an aliasing frequency, said aliasing frequency being a
5 function of a clock signal; and

6 (c) outputting said down-converted signal.

1 15. The method of claim 14, wherein said clock signal has a clock frequency,
2 the method further comprising the step of:

16. The method of claim 13, further comprising the steps of:

(8) selecting a decoder to be a selected decoder, said selected decoder being configured to operate with said monitored channel/band combination; and

(9) using said selected decoder to create a decoded down-converted signal from said filtered down-converted signal.

17. The method of claim 13, further comprising the steps of:

(8) repeating steps (3) through (7).

18. The method of claim 13, wherein said down-converted signal is an intermediate frequency signal.

1 19. The method of claim 16, wherein said down-converted signal is a
2 baseband signal.

20. A system for communicating, comprising:

an input filter module comprised of one or more input filters to filter one or more input signals so as to generate one or more filtered input signals;

4 a universal frequency translator to down-convert at least one of said one or
5 more filtered input signals to generate a down-converted signal; and
6 an output filter module comprised of one or more output filters to filter
7 said down-converted signal.

1 21. The system of claim 20, further comprising a control signal generator that
2 outputs a control signal, wherein said universal frequency translator operates
3 according to said control signal.
B10 cont

1 22. The system of claim 21, wherein said control signal generator is a voltage
2 controlled oscillator.

1 23. The system of claim 21, further comprising a decoder module comprised
2 of one or more decoders, wherein said decoder module decodes said filtered
3 down-converted signal to generate a decoded output signal

1 24. The system of claim 23, further comprising a controller that operates under
2 the direction of a user, said controller to issue at least a first command signal, a
3 second command signal, a third command signal, a fourth command signal, and a
4 fifth command signal, wherein

5 said input filter module operates according to said first command signal,
6 said universal frequency translator operates according to said second
7 command signal,

8 said control signal generator operates according to said third command
9 signal,

10 said output filter module operates according to said fourth command
11 signal, and

12 said decoder module operates according to said fifth command signal.

1 25. The system of claim 20, wherein said down-converted signal is a base
2 band signal.

1 26. The system of claim 20, wherein said down-converted signal is an
2 intermediate frequency signal.